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ABSTRACT

In 1979, the typical entering seventh grade student at Perris Valley Junior High School (California) scored 21 months below grade norm in reading and 25 months below grade norm in language. To provide the students with language processing skills necessary for participation in the regular school curriculum, students in both junior and senior high school were offered a daily learning experience in the Formula Three Reading, Spelling, Learning Program. The course of instruction starts with 40 skills lessons in which students review or learn the sound-letter relationships and major spelling patterns. Students then learn to incorporate this information into the Reading Formula so they can decode the written language: the Spelling Formula so they can encode and so spell correctly the language: and the Learning Formula so they can clarify the vocabulary and content of whatever they read. Possession of these three skills gives students random access rather than linear access to the written language. The application part of the program starts with eight advanced reading and spelling lessons. After the total 48 lessons have been completed, students use the newly learned skills when working in academic content areas and vocational and fine arts classes. (HOD)

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PERRIS UNION HIGH SCHOOL DISTRICT'S FORMULA-THREE LANGUAGE PROCESSING PROGRAM--THE FIRST YEAR, 1979-1980 OUTCOMES FOR 269 SEVENTH GRADERS

By Edward O. Vail

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Perris Union High School District's Formula-Three Language Processing Program—The First Year, 1979-1980 Outcomes for 269 Seventh Graders

By Edward O. Vail

Date of Study: October, 1980

What does it mean to a junior high school's faculty when 79% of their incoming seventh graders test below grade norm in Reading, when 82% test below in Language, and 81% test below in Reference-Study Skills?

Ask the teachers at Perris Valley Junior High School in Perris, California. In September, 1979 their typical entering seventh grader scored 21 months below grade norm in Reading (Vocabulary, 5.2; Comprehension, 4.5; Total Reading, 4.9) and 25 months below grade norm in Language (Mechanics, 4.4; Expression, 4.6; Spelling, 5.0; Total Language, 4.5).

What this meant to those teachers was that two-thirds of their 366 entering seventh grade students did not possess the necessary vocabulary, information, or language processing skills to participate successfully in the junior high school curriculum. What these data also suggested was that *no department would be immune* to the impact caused by these undereducated youngsters, because here was a group of students who could no better read and process a seventh grade social studies book than they could learn from the written curricular material used in the fine and practical arts.

What could be done to attack this problem?

Most of the administrators, teachers, and members of the board of education in the Perris Union High School District believe that problems of gross undereducation in students have to be overcome in their own two schools, the junior and the senior high school. It is accepted that each student's social class, ethnicity, language background, and mobility are *fixed variables* over which the schools have no control. However, a student's language processing skills, vocabulary, and store of information are viewed as being *alterable variables* which can be improved substantially through proper instruction.

Instead of watering down their curriculum to accommodate the students' educational deficiencies—a common practice in many secondary schools—the *Perris educators have opted to teach their students* the vocabulary, information, and language processing skills necessary for participation in the regular curriculum.

In large measure they are doing this by offering every seventh and eighth grader at Perris Valley Junior High School and every ninth and tenth grader at Perris Senior High School a daily learning experience in the Formula-Three Reading, Spelling, Learning Program. This was the district's number one priority and all monies used for the program described in this study came from district funds.

This study treats with the first year's outcomes for 269 seventh grade students who participated in that program during school year 1979-1980. All test scores and demographic data have been provided by the Perris Union High School District.

The seventh graders were chosen for detailed study because they will remain in district schools the longest and, thus, provide researchers the greatest time to study their progress.

Before examining the educational outcomes, we shall look at:

1. The *community* and the *students* who attend Perris Valley Junior High School.
2. The *Formula-Three Program* selected by the district's teachers, administrators, and board of education as the teaching tool they wished to use to improve students' reading, spelling, and learning skills.
3. The *Language Processing Chain,* the specific program design employed so that the same body of skills could be taught to several hundred students by teachers from every content area.

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Demographic Data

Perris Union High School District is located 70 miles southeast of Los Angeles in Riverside County. The district covers about 250 square miles and in size is the third largest high school district in California. Five elementary districts send their students to the district's junior high school.

Data from the *California Assessment Program* show that the district is at the 86%ile for minority students; at the 86%ile for student mobility; and at the 95%ile for AFDC (Aid for Dependent Children). Over the past few years, achievement levels for twelfth grade students have varied between the 2%ile and the 8%ile for California seniors.

Perris Valley Junior High School enrolls seventh and eighth graders. It is naturally integrated. On October 15, 1979 the student body was 21% Black, 24% Hispanic, 54% White, and 1% Other. Student mobility is such at the school that while 366 seventh grade students were pre-tested in September, 1979 and 355 were post-tested in June, 1980, only 269 of these students were present for both tests. This study treats with outcomes for these 269 students.

Formula-Three Reading, Spelling, Learning Program

Formula-Three is a direct instruction language processing system designed for use with upper elementary through adult students. The authors define "language processing" in this way:[1]

> *To teach language processing is to teach students how to clarify the information in the material they are reading or discussing so that they are able to understand it, evaluate it, learn it, store it, recall it, and use it. Language processing never interrupts reading because language processing* is *reading.*

The program's course of instruction starts with 40 skills lessons in which students learn, or review, the sound-letter relationships and major spelling patterns found in written English. Students then learn to incorporate this information into the Formula-Three Reading Formula so they can decode the written language; the Spelling Formula so they can encode and so spell correctly the language; and the Learning Formula so they can clarify the vocabulary and content of whatever they read. Possession of these three skills gives students *random access* rather than *linear access* to the written language.

The application part of the program starts with eight advanced reading and spelling lessons during which students practice using their new language processing skills. After the total 48 Formula-Three lessons have been completed, students use these new reading, spelling, and learning skills when working in content area, vocational, and fine arts classes in school, or when reading independently outside of school.

The Formula-Three Program is published by Integrative Learning Systems, Inc. of Glendale, California.

Program Design

Instead of having only English, reading, and special education teachers offer the Formula-Three instruction, as is the usual practice in secondary and post-secondary programs, a "Language Processing Chain" was designed for and installed in both schools. This design permitted every seventh through tenth grade student and most of the district's teachers to be actively involved in the instructional program.

With this program design, students were first assigned to homogeneous groups of about 20 students which met for about 40 minutes every day during the same period.[2] During the first phase of the program each teacher (38 groups in the junior high school and 35 groups in the senior high school) took one group through the entire Formula-Three course of instruction. When this instruction was completed, the program moved into its second phase and all groups rotated to new teachers where they read and processed material written at the group's instructional level. Thereafter, groups rotated to a new teacher every five or six weeks.

As students improved, they moved up to more advanced groups where they read and processed even more difficult reading matter. The rotations were designed to assure that each teacher worked with groups of high, middle, and low ability. Since all instructors had a place in the "Language Processing Chain," they were able to help students practice the skills taught there in all the other classes which met during the day.

Educational Outcomes

During its first year how did the Formula-Three Program affect the language processing capability of the seventh graders? Are students moving toward a time when most of them will be able to participate in the regular junior high school course of instruction?

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[1] Edward O. Vail and Colleen M. Vail. *Formula-Three Reading, Spelling, Learning Program Instructor's Manual* (Integrative Learning Systems, Inc., Glendale, California, 1978) p. T74.

[2] For a detailed study which documents the superiority of direct instruction in teaching basic cognitive skills to junior high school students, while also raising self concepts, see: *Small Group vs. Individualized Instruction,* Center for Social Organization of Schools, Johns Hopkins University, Baltimore, Maryland, 1980.

All Seventh Graders

Table I, which treats with outcomes for the *entire* class, provides some answers to the above questions. Grade Equivalent, percentile ranking, and stanine scores for this group show significant forward movement in that direction. In view of the program objective to raise achievement potential in *all* district students, it is significant that on the pre-test these students scored at the third stanine (below average) on *every* test, while on the post-test they scored at the fourth stanine (average) on *every* test.

There is little doubt that a high rate of student mobility, such as that at Perris Valley Junior High School, will have an overall negative effect on the achievement for all students. However, these data reflect the fact that some of the impact caused by high transiency was overcome by arranging for every student who transferred into the school to participate in the 40 Formula-Three skills lessons before being assigned to an appropriate Language Processing Group.

Table I
All Seventh Graders
Pre-Test, September, 1979 / Post-Test, June, 1980 / C.T.B.S., Form Q, Level 3

Reading

	N		G.E.	%ile	Sta.		G.E.	%ile	Sta.		G.E.	%ile	Sta.		G.E.	%ile	Sta.
Pre-Test	366	Voc.	5.2	22	3	Comp.	4.5	17	3					Total	4.9	18	3
Post-Test	355	Voc.	6.3	28	4	Comp.	5.7	26	4					Total	6.0	25	4
Difference			**+ 1.1**	**+ 6**	**+1**		**+ 1.2**	**+ 9**	**+1**						**+ 1.1**	**+ 7**	**+1**

Language

Pre-Test	366	Mech.	4.4	15	3	Expr.	4.6	20	3	Spell.	5.0	18	3	Total	4.5	13	3
Post-Test	355	Mech.	6.0	29	4	Expr.	5.4	23	4	Spell.	5.9	25	4	Total	5.8	23	4
Difference			**+ 1.6**	**+14**	**+1**		**+ 0.8**	**+ 3**	**+1**		**+ 0.9**	**+ 7**	**+1**		**+ 1.3**	**+10**	**+1**

N = Number; G.E. = Grade Equivalent; %ile = Percentile Ranking; Sta. = Stanine

A better perspective concerning both the actual degree of educational disability present in the entering seventh grade class and the impact of the program on those students can be gained by examining outcomes for the 269 students who completed both the pre-test and the post-test.

These students are divided into three groups according to their Total Reading scores on the pre-test. The groups are: Below Average, 2.0 to 5.9; Average, 6.0 to 7.9; and Above Average, 8.0 to 12.9.

The Below Average Group

Table II treats with those 181 students in the Below Average group comprising 67% of the target pupils. Within that population 78 students (43%) were severely retarded in reading and scored below 3.9 in Total Reading on the pre-test. Mainstreamed in the Language Processing Groups serving these Below Average students were 10 Special Education students (Educable Mentally Retarded and Learning Disability Group) and 7 limited or non-English speaking students. These atypical students comprised 9.4% of the Below Average group.

Table II
Below Average Group (2.0 to 5.9 in Total Reading)
Pre-Test, September, 1979 / Post-Test, June, 1980 / C.T.B.S., Form Q, Level 3 / N = 181

Reading

		G.E.	%ile	Sta.		G.E.	%ile	Sta.		G.E.	%ile	Sta.		G.E.	%ile	Sta.
Pre-Test	Voc.	4.6	14	3	Comp.	4.1	13	3					Total	4.4	11	3
Post-Test	Voc.	5.3	16	3	Comp.	4.7	15	3					Total	5.1	15	3
Difference		**+ 0.7**	**+ 2**	**0**		**+ 0.6**	**+ 2**	**0**						**+ 0.7**	**+ 4**	**0**

Language

Pre-Test	Mech.	4.0	11	3	Expr.	4.1	15	3	Spell.	4.7	15	3	Total	4.2	11	3
Post-Test	Mech.	4.5	18	3	Expr.	5.0	19	3	Spell.	5.2	17	3	Total	4.9	14	3
Difference		**+ 0.5**	**+ 7**	**0**		**+ 0.9**	**+ 4**	**0**		**+ 0.5**	**+ 2**	**0**		**+ 0.7**	**+ 3**	**0**

Study Skills

Pre-Test	Ref.	4.6	15	3	Graph	4.4	13	3
Post-Test	Ref.	5.0	16	3	Graph	5.2	18	3
Difference		**+ 0.4**	**+ 1**	**0**		**+ 0.8**	**+ 5**	**0**

G.E. = Grade Equivalent; %ile = Percentile Ranking; Sta. = Stanine

The Average Group

Table III treats with those 60 students in the Average group, 22% of the target pupils. Outcomes in Reading for these students follow the same pattern found in earlier studies of "chain" programs where growth in Reading Comprehension exceeded that in Reading Vocabulary.

On the pre-test these 60 Average group students exceeded the 7.0 grade norm with a 50%ile rank on only one test, Reading Vocabulary. On the pre-test they scored at the 5th stanine on only 4 of 9 tests. On the post-test, however, they scored at or above the 8.0 grade norm on 5 tests, exceeded the 50%ile on 7 of 9 tests, and scored at the 5th stanine on *every* test.

Table III
Average Group (6.0 to 7.9 in Total Reading)
Pre-Test, September, 1979 / Post-Test, June, 1980 / C.T.B.S., Form Q, Level 3 / N = 60

		Reading															
		G.E.	%ile	Sta.		G.E.	%ile	Sta.		G.E.	%ile	Sta.		G.E.	%ile	Sta.
Pre-Test	Voc.	7.1	50	5	Comp.	6.5	42	5					Total	6.9	46	5
Post-Test	Voc.	8.0	53	5	Comp.	8.0	53	5					Total	8.0	54	5
Difference		**+ 0.9**	**+ 3**	**0**		**+ 1.5**	**+11**	**0**						**+ 1.1**	**+ 8**	**0**
		Language														
Pre-Test	Mech.	6.1	36	4	Expr.	6.5	41	5	Spell.	6.5	40	4	Total	6.3	37	4
Post-Test	Mech.	7.5	47	5	Expr.	8.0	53	5	Spell.	7.8	51	5	Total	7.8	51	5
Difference		**+ 1.4**	**+11**	**+1**		**+ 1.5**	**+12**	**0**		**+ 1.3**	**+11**	**+1**		**+ 1.5**	**+14**	**+1**
		Study Skills														
Pre-Test	Ref.	6.2	38	4	Graph	6.2	38	4								
Post-Test	Ref.	8.2	54	5	Graph	7.3	45	5								
Difference		**+ 2.0**	**+16**	**+1**		**+ 1.1**	**+ 7**	**+1**								

G.E. = Grade Equivalent; %ile = Percentile Ranking; Sta. = Stanine

The Above Average Group

Table IV treats with those 28 students in the Above Average group, 10% of the target students. Before their language processing program began, there was much discussion in the district concerning what outcomes might be expected for the more able students. The answer seems to be that in every area where those students tested below expectancy on the pre-test, they made impressive gains on the post-test. Thus, 27 months growth in Mechanics of Language (7.5 to 10.2); 21 months growth in Spelling (7.8 to 9.9) and 31 months growth in Graphic Study Skills (7.7 to 10.8).

Form Q, Level 3 of the C.T.B.S. (Comprehensive Test of Basic Skills) is normed through 12.9. These students reached that limit 22 times on the pre-test items and 37 times on post-test items.

Table IV
Above Average Group (8.0 to 12.9 in Total Reading)
Pre-Test, September, 1979 / Post-Test, June, 1980 / C.T.B.S., Form Q, Level 3 / N =28

		Reading															
		G.E.	%ile	Sta.		G.E.	%ile	Sta.		G.E.	%ile	Sta.		G.E.	%ile	Sta.
Pre-Test	Voc.	9.3	82	7	Comp.	9.5	78	7					Total	9.3	80	7
Post-Test	Voc.	9.9	80	7	Comp.	10.7	79	7					Total	10.0	79	7
Difference		**+ 0.6**	**–2**	**0**		**+ 1.2**	**+ 1**	**0**						**+ 0.7**	**–1**	**0**
		Language														
Pre-Test	Mech.	7.5	54	5	Expr.	9.9	79	7	Spell.	7.8	60	6	Total	8.8	72	6
Post-Test	Mech.	10.2	73	6	Expr.	10.6	78	7	Spell.	9.9	73	6	Total	10.2	79	7
Difference		**+ 2.7**	**+19**	**+1**		**+ 0.7**	**–1**	**0**		**+ 2.1**	**+13**	**0**		**+ 1.4**	**+ 7**	**+1**
		Study Skills														
Pre-Test	Ref.	9.1	71	6	Graph	7.7	58	5								
Post-Test	Ref.	10.8	80	7	Graph	10.8	78	7								
Difference		**+ 1.7**	**+ 9**	**+1**		**+ 3.1**	**+20**	**+2**								

G.E. = Grade Equivalent; %ile = Percentile Ranking; Sta. = Stanine

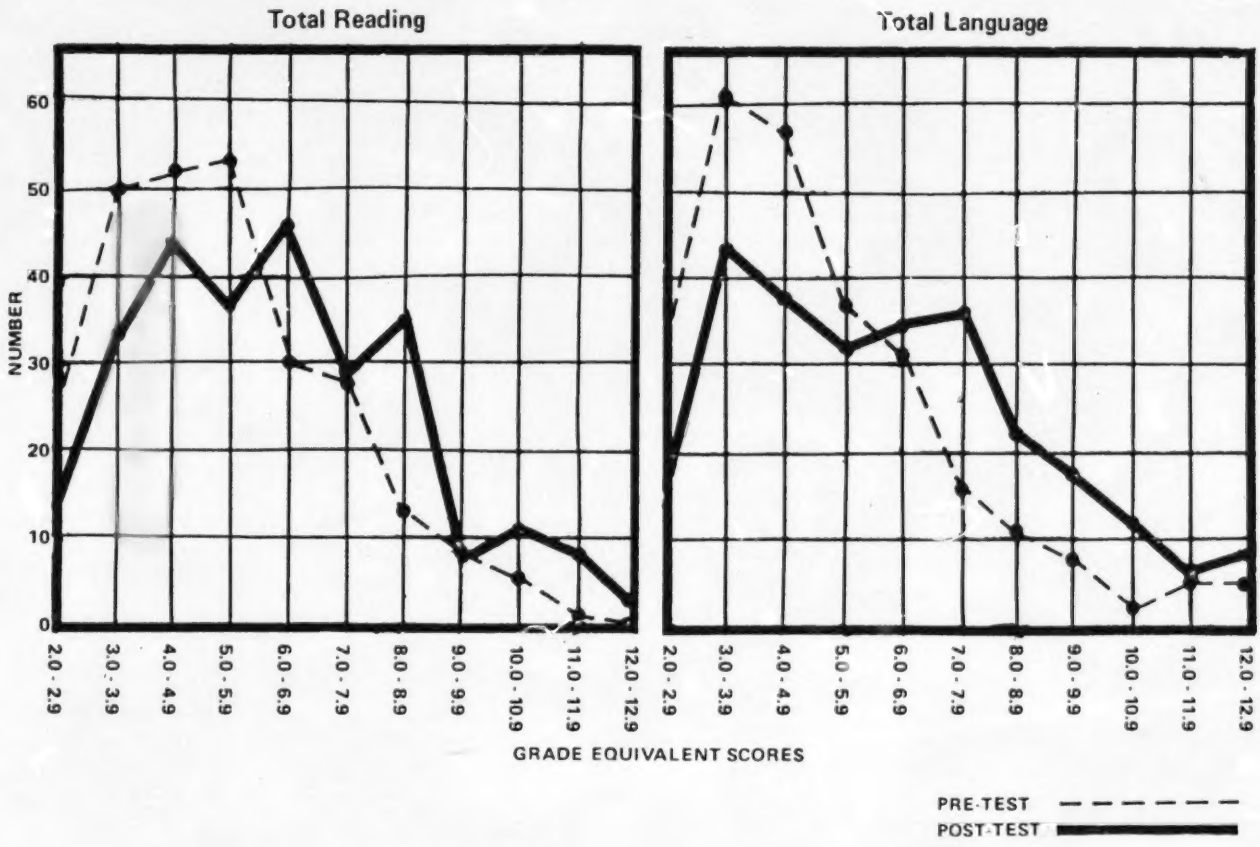
Pre-Test and Post-Test Profiles

How successful was the Formula-Three Program in improving academic achievement levels of seventh graders at Perris Valley Junior High School?

Table V shows the distribution of Total Reading and Total Language scores on the pre- and post-tests. These data demonstrate that gains have been made by students at every achievement level. For example, between the pre- and the post-tests the percentage of students scoring at or below 5.9 in Total Reading *decreased* from 68% to 48% (20%) and in Total Language from 71% to 49% (22%). At the other end of the scale the percentage of students scoring at or above 8.0 in Total Reading *increased* from 11% to 24% (13%) and in Total Language from 12% to 24% (12%).

When the nature of the student population is viewed in terms of its size, its demographic characteristics, and generally low level of earlier educational achievement, this must be considered a promising first step.

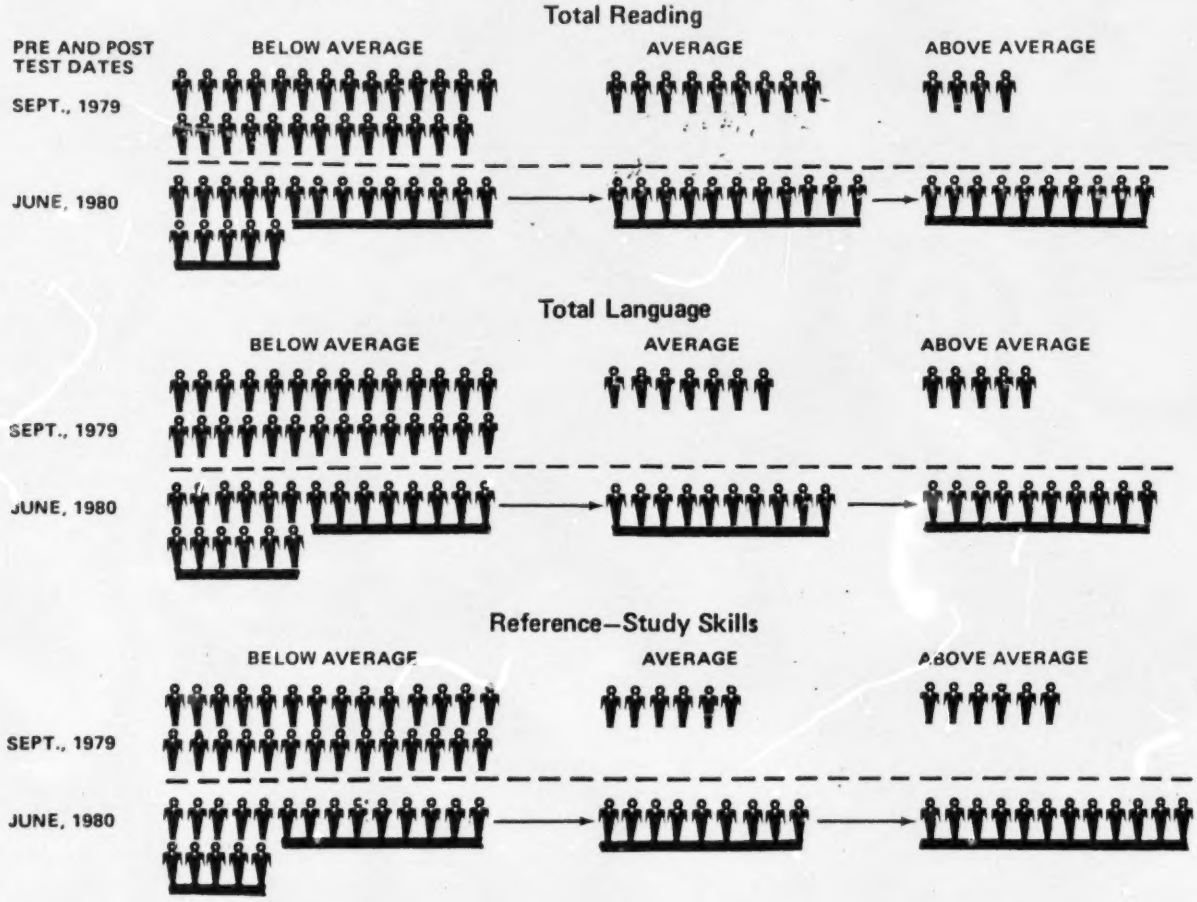
Table V
Pre-Test and Post-Test Profiles
269 Seventh Graders at Perris Valley Junior High School
Pre-Test, September, 1979 / Post-Test, June, 1980 / C.T.B.S., Form Q, Level 3



Summary

- Did participation in the Formula-Three Program work to improve the critical learning skills of Perris Valley Junior High School's seventh graders?
- How is the program impacting on the academic climate in the classrooms?
- Can teachers expect that their students will be able to participate in a higher level of instructional activity?

Profile of Typical Seventh Grade Classroom (40 Students)
Perris Valley Junior High School—September, 1979 and June, 1980



The above graph provides some insight into the answers to these questions. Pictured is a typical heterogeneously grouped seventh grade class at Perris Valley Junior High School. In this typical class the students are proportionately distributed according to their pre-test and post-test scores in Total Reading, Total Language, and Reference-Study Skills.

The figures show that in any seventh grade heterogeneously grouped academic, fine arts, or practical arts class, the percentage of students who tested in the Average and Above Average range during the 1979-80 school year increased from 32% to 52% in Total Reading; from 30% to 50% in Total Language; and from 32% to 53% in Reference-Study Skills.

It would appear that a significant number of these seventh graders are being taught the vocabulary, information, and language processing skills necessary for participation in the regular curriculum.

Before this program began, few of the teachers in the Perris Union High School District had taught either remedial or developmental reading. Only a few of the teachers had ever taught the entire body of language arts and study skills. Therefore, the achievement as demonstrated on the above graph represents a remarkable accomplishment on the part of the teachers.

First year results of the Formula-Three Reading, Spelling, Learning Program at Perris suggest that educational deprivation in students who are poor and/or linguistically, culturally, or racially different is not fixed. Rather, educational deprivation is an alterable variable that proper educational intervention can reverse—even when it occurs in secondary students.